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REMARKS

Claims 1-28 are pending in the application. Claims 1, 11, and 18 are independent claims.

Independent claim 1 has been amended to replace intended use language with operative language. Claim 1 also now specifies reflection of the acoustic signal in the formation.

Claims 3-5, and 7-9 have been amended to replace intended use language with operative structural language.

Independent claim 11 has been amended to specify that the acoustic signal is axially directed.

Independent claim 18 and dependent claims 21-26 have been amended to replace intended use language with operative language.

The Examiner's objections and rejections are addressed in substantially the same order as in the referenced office action.

REJECTION UNDER 35 USC § 102

Claims 1-4, 6, 10, 18-22 and 24-27 stand rejected under 35 USC § 102(b) over US6088294 to *Leggett et al.* Claims 1 and 18 are independent claims.

The present invention provides a method and apparatus for acoustic position logging ahead of a drill bit. The method and apparatus comprise a bottomhole assembly (BHA) conveyed on a drilling tubular in a borehole within an earth formation. The BHA
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has a source array which emits a preselected acoustic signal into the earth formation, and at least one receiver on the BHA which receives a second acoustic signal produced by an interaction of the preselected acoustic signal with said formation.

It should be emphasized that claim 1 has been amended to replace intended use language with operative language. Accordingly, the mere possibility that a prior art reference could be used to duplicate the claimed structural elements does not anticipate a claim—there must be a teaching in the prior art of structure which duplicates the claimed structure.

As the Examiner has noted, *Leggett* describes many of the elements of the invention of claim 1. The Examiner has specifically identified **col. 8 lines 40-62** for a teaching of emitting preselected signals in the borehole axis direction in the earth formation.

The Examiner appears to have overlooked the following in *Leggett*:

“In one mode of operation, the acoustic system for determining the formation acoustic velocities is selectively activated when drilling and the acoustic system for determining the bed boundary information is activated when the drilling activity is stopped so as to substantially reduce acoustic noise generated by the drill bit.” **Col. 9 li 68-col 10 li 6.**

The portion cited by the Examiner refers to Fig. 3a, and deals with the determining formation velocities. The configuration used for determining bed

boundaries, on the other hand, is shown in Fig. 5a and clearly does not involve signals propagating in an axial direction.

To put it another way, the embodiment of *Leggett* that is used for receiving a reflected signal as specified in element (b) of claim 1 does not disclose signals propagating along an axial direction.

In order for a claimed invention to be unpatentable under 35 USC § 102, a single prior art reference must disclose each and every element of the claim arranged as in the claim. This is clearly lacking in the present instance. Accordingly, applicant respectfully submits that claim 1 and claims 2-10 that depend upon claim 1 are patentable under 35 USC § 102 over *Leggett*.

It is further noted that none of the prior art of record discloses the particular elements of claim 1 discussed above, viz., a source array which emits a signal in the borehole axis direction and a receiver which receives a reflected signal. Accordingly, applicant further submits that claim 1 and claims 2-10 are also patentable under 35 USC §103 over *Leggett* and the prior art of record.

Claim 18 includes the substantive elements of claim 1 discussed above. Accordingly, claim 18 and claims 19-28 that depend upon claim 18 are patentable under 35 USC §§ 102-103 over *Leggett* and the prior art of record for the same reasons that claim 1 is patentable under 35 USC §§ 102-103 over *Leggett* and the prior art of record.

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Claims 1-5, 10, 18, 20-22 and 35-27 stand rejected under 35USC §102(e) as being anticipated by US 6084826 to *Leggett*. Claims 1 and 18 are independent claims.

The Examiner has referred to col 14 lines 40-60. The cited portion discusses Fig. 8 of the patent and it can be clearly seen that the raypaths from the transmitter 180 are not in an axial direction. This is the same issue that was discussed above with reference to the *Leggett* '294 reference.

In order to sustain a rejection under 35 USC § 102, a single prior art reference must disclose each and every element of the claim arranged as in the claim. This is clearly lacking in the present case. Accordingly, claim 1 and claims 2-10 that depend upon claim 1 are patentable under 35 USC § 102 over *Leggett* '360.

It is further noted that none of the prior art of record discloses the particular elements of claim 1 discussed above, viz., a source array which emits a signal in the borehole axis direction and a receiver which receives a reflected signal. Accordingly, applicant further submits that claim 1 and claims 2-10 are also patentable under 35 USC §103 over *Leggett* '360 and the prior art of record.

Claim 18 includes the substantive elements of claim 1 discussed above. Accordingly, claim 18 and claims 19-28 that depend upon claim 18 are patentable under 35 USC §§ 102-103 over *Leggett* '360 and the prior art of record for the same reasons 10/641,356.

that claim 1 is patentable under 35 USC §§ 102-103 over *Leggett* and the prior art of record.

REJECTIONS UNDER 35 USC § 103

Claims 11-16 unpatentable over *Leggett* et al. '294 in view of Coates.

Claim 11 as amended specifies generating an acoustic signal in the borehole axis direction using an axially directed acoustic array. As noted above, *Leggett* '294 does not teach or suggest generating an acoustic signal in an axial direction, does not teach or suggest using an axially directed array for generating an acoustic signal in the axial direction and does not teach or suggest determining a parameter of interest from a reflection of an axially directed signal.

In order to sustain an obviousness rejection under 35 USC § 103, two requirements must be met. First, the prior art of record must disclose all the limitations of the claimed invention. The references together and in combination do not disclose or suggest all the limitations of the claimed invention. Applicant submits that no art of record either alone or when combined with other art of record discloses or suggests all the elements of the invention of claim 11. Accordingly, applicant respectfully submits that claim 11 and claims 12-17 that depend upon claim 11 are patentable under 35 USC § 103 over *Leggett* '294 and the prior art of record.

Claims 5 and 17 stand rejected under 35 USC § 103 over *Leggett '294* and further in view of *Leggett '360*. Applicant notes that the combination of *Leggett '294* and *Leggett '360* does not teach or suggest the particular features of independent claims 1 and 11 discussed above. Accordingly, claims 5 and 17 are patentable under 35 USC § 103 over *Leggett '294* and further in view of *Leggett '360*.

Claims 7-9, 23 and 28 stand rejected under 35 USC § 103 over *Leggett '294* or *Leggett '360* and further in view of *Robbins* or *Coates*. Applicant notes that the combination of *Leggett '294*, *Leggett '360*, *Robbins* and *Coates* does not teach or suggest the particular features of independent claims 1 and 18 discussed above. Accordingly, claims 5 and 17 are patentable under 35 USC § 103 over *Leggett '294* or *Leggett '360* and further in view of *Robbins* or *Coates*.

Claims 11-16 and 19 stand rejected under 35 USC § 103 over *Leggett '294* and further in view of *Beresford*. Applicant notes that the combination of *Leggett '294* and *Beresford* does not teach or suggest the particular features of independent claims 11 and 18 discussed above. Accordingly, claims 11-16 and 19 are patentable under 35 USC § 103 over *Leggett '294* and further in view of *Beresford*.

CONCLUSION

For all the foregoing reasons, Applicant submits that the application is in a condition for allowance. No fee is believed due for this paper. The Commissioner is
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hereby authorized to charge any additional fees or credit any overpayment to Deposit
Account No. 02-0429 (414-30676-US).

Respectfully submitted,

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